

1. A tube fitting for connecting a first fluid device with a second fluid device, said fitting comprising:

a fitting body associated with the first fluid device, said fitting body having an axis;

a tubular member associated with the second fluid device; and

a nut rotatable on said fitting body about the axis to secure the fitting body coaxially to the tubular member thereby to connect the first fluid device with the second fluid device;

said fitting body having a connector groove;

said tubular member having a connector end portion that fits into said connector groove of said fitting body, said tubular member having a radially outward bulge with a seal surface and a driven surface on opposite ends of said bulge.

2. A tube fitting as set forth in claim 1 wherein said tubular member has a constant inner diameter in the location of said bulge.

3. A tube fitting as set forth in claim 1 wherein said bulge is machined on said tubular member.

4. A tube fitting as set forth in claim 1 wherein said tubular member is molded.

5. A tube fitting as set forth in claim 1 wherein said driven surface and said seal surface are radially flared.

6. A tube fitting as set forth in claim 1 wherein said driven surface and said seal surface radially taper in axially opposite directions.

7. A tube fitting as set forth in claim 1 wherein said connector end portion of said tubular member comprises a groove between two radially spaced flanges, the radially outer one of said two radially spaced flanges projecting axially farther than the radially inner flange, the radially outer flange being receivable in a groove of said fitting body between two radially spaced flanges of said fitting body.

8. A tube fitting as set forth in claim 7 wherein said radially outer flange of said two radially spaced flanges of said fitting body projects radially farther than the radially inner flange of said two radially spaced flanges of said fitting body and is externally threaded and is internally engageable with said bulge on said tubular member.

9. A tube fitting as set forth in claim 1 wherein said nut is a multiple piece assembly including a split ring having an inner diameter that is less than the outer diameter of said bulge on said tubular member.

10. A tube fitting as set forth in claim 9 wherein said tubular member has a constant inner diameter in the location of said bulge.

11. A tube fitting for connecting a first fluid device with a second fluid device, said tube fitting comprising:

a fitting body associated with the first fluid device, said fitting body having an axis, said fitting body having a connector groove;

a tubular member associated with the second fluid device, said tubular member having a connector end portion that fits into said connector groove of said fitting body, and a bulge that is spaced apart along the length of said tubular member from said connector end portion; and

a nut threadably rotatable on said fitting body about the axis to secure the fitting body coaxially to the tubular member thereby to connect the first fluid device with the second fluid device;

the outer diameter of said bulge on said tubular member being greater than the inner diameter of said nut;

said bulge on said tubular member being clamped axially between said nut and said fitting body to secure said tubular member to said fitting body.

12. A tube fitting as set forth in claim 11 wherein said nut is a multiple piece assembly including a split ring having an inner diameter that is less than the outer diameter of said bulge on said tubular member.

13. A tube fitting as set forth in claim 12 wherein said split ring is unthreaded and said nut further includes an internally threaded nut body that threadably engages said fitting body, said split ring having a drive surface that engages said bulge on said tubular member.

14. A tube fitting as set forth in claim 11 wherein said tubular member has a constant inner diameter in the location of said bulge.

15. A tube fitting as set forth in claim 11 wherein said bulge is machined on said tubular member.

16. A tube fitting as set forth in claim 11 wherein said tubular member is molded.

17. A tube fitting as set forth in claim 11 wherein said driven surface and said seal surface are radially flared.

18. A tube fitting as set forth in claim 11 wherein said driven surface and said seal surface radially taper in axially opposite directions.

19. A tube fitting as set forth in claim 1 wherein said tubular member is molded as one piece from plastic and includes said bulge and said end connector portion.

20. An end connection for a tube fitting, comprising:
a tubular member having a first end joinable to a fluid device and a second end;
said second end of said tubular member having an end configuration that can be mated with a second end connection;
said tubular member having a circumferential bulge axially behind said second end.

21. An end connection as set forth in claim 20 wherein said bulge is formed as one piece with said tubular member.

22. An end connection as set forth in claim 21 wherein said bulge is machined.

23. An end connection as set forth in claim 21 wherein said tubular member is molded.

24. An end connection as set forth in claim 20 wherein said bulge comprises a driven surface at a back end of said bulge.

25. An end connection as set forth in claim 24 wherein said driven surface contacts a drive surface of a nut that threadably engages said second end connection when the tube fitting is made up.

26. An end connection as set forth in claim 24 wherein said bulge comprises a seal surface axially opposite said driven surface.

27. An end connection as set forth in claim 26 wherein said driven surface and said seal surface are radially flared.

28. An end connection as set forth in claim 26 wherein said driven surface and said seal surface radially taper in axially opposite directions.

29. An end connection as set forth in claim 20 wherein said second end of said tubular member comprises an axially extending flange that is sealingly received in a groove of the second end connection when said tubular member is mated with the second end connection.

30. An end connection as set forth in claim 29 wherein said tubular member has an inner side surface defining a fluid flow path through said tubular member, said second end of said tubular member comprising a sealing rim at an end of said inner side surface, said sealing rim being sealingly engageable with a seal surface on the second end connection at a location radially inward of said flange.

31. An end connection as set forth in claim 20 wherein said second end of said tubular member comprises a groove between two radially spaced flanges, the radially outer one of said two radially spaced flanges projecting axially farther than the radially inner flange, the radially outer flange being receivable in a groove of the second end connection between two radially spaced flanges of the second end connection.

32. An end connection as set forth in claim 31 wherein the radially outer flange of the two radially spaced flanges of the second end connection projects radially farther than the radially inner flange of the two radially spaced flanges of the second end connection and is externally threaded and is internally engageable with said circumferential bulge on said tubular member.

33. An end connection as set forth in claim 20 wherein said tubular member is molded as one piece from plastic and includes said bulge.

34. An end connection as set forth in claim 33 wherein said tubular member has a constant inner diameter along the length of said bulge.

35. A tube fitting comprising:

a first end connection comprising a tubular member having a first end joinable to a first fluid device and a second end;

a second end connection joinable to a second fluid device;

said second end of said tubular member having an end configuration that can be mated with said second end connection;

said tubular member having a circumferential bulge axially behind said second end.

36. A tube fitting as set forth in claim 35 wherein said bulge of said first end connection is formed as one piece with said tubular member.

37. A tube fitting as set forth in claim 36 wherein said tubular member is molded.

38. A tube fitting as set forth in claim 35 wherein said bulge comprises a driven surface at a back end of said bulge, said tube fitting further comprising a nut that threadably engages said second end connection when the tube fitting is made up, said driven surface contacting a drive surface of said nut.

39. A tube fitting as set forth in claim 24 wherein said bulge comprises a seal surface axially opposite said driven surface.

40. A tube fitting as set forth in claim 39 wherein said driven surface and said seal surface are radially flared.

41. A tube fitting as set forth in claim 39 wherein said driven surface and said seal surface radially taper in axially opposite directions.

42. A tube fitting as set forth in claim 35 wherein said second end connection has a groove that sealingly receives an axially extending flange of said first end connection when said first end connection is mated with the second end connection.

43. A tube fitting as set forth in claim 42 wherein said first end connection has an inner side surface defining a fluid flow path through said first end connection, said second end of said tubular member comprising a sealing rim at a terminal end of said inner side surface, said second end connection having a seal surface at a location radially inward of said flange of said flange of said first end connection, said sealing rim on said first end connection being sealingly engageable with said seal surface on said second end connection when said first end connection is mated with said second end connection.

44. A tube fitting as set forth in claim 42 wherein said second end of said tubular member comprises a groove between two radially spaced flanges, the radially outer one of said two radially spaced flanges projecting axially farther than the radially inner flange, said second end connection having a groove between two radially spaced flanges of said second end connection, said radially outer flange of said first end connection being received in groove of the second end connection between two radially spaced flanges of the second end connection.

45. A tube fitting as set forth in claim 44 wherein the radially outer flange of the two radially spaced flanges of the second end connection projects radially farther than the radially inner flange of the two radially spaced flanges of the second end connection and is externally

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threaded and is internally engageable in sealing engagement with said circumferential bulge on
said tubular member.

46. A tube fitting as set forth in claim 39 wherein said second end connection comprises an annular flange that extends around said bulge and that has a seal surface for engaging said seal surface on said bulge.

47. A tube fitting as set forth in claim 46 further comprising a multiple-piece nut having a drive surface for engaging said driven surface of said bulge, said annular flange of said second end connection being threadably engageable with said multiple-piece nut during make up of said fitting.